

Monthly Marine Biotoxin Report

November 2006

Technical Report No. 06-23

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of November, 2006. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at sites between San Luis Obispo and Los Angeles counties during November (Figure 1). These

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during November, 2006.

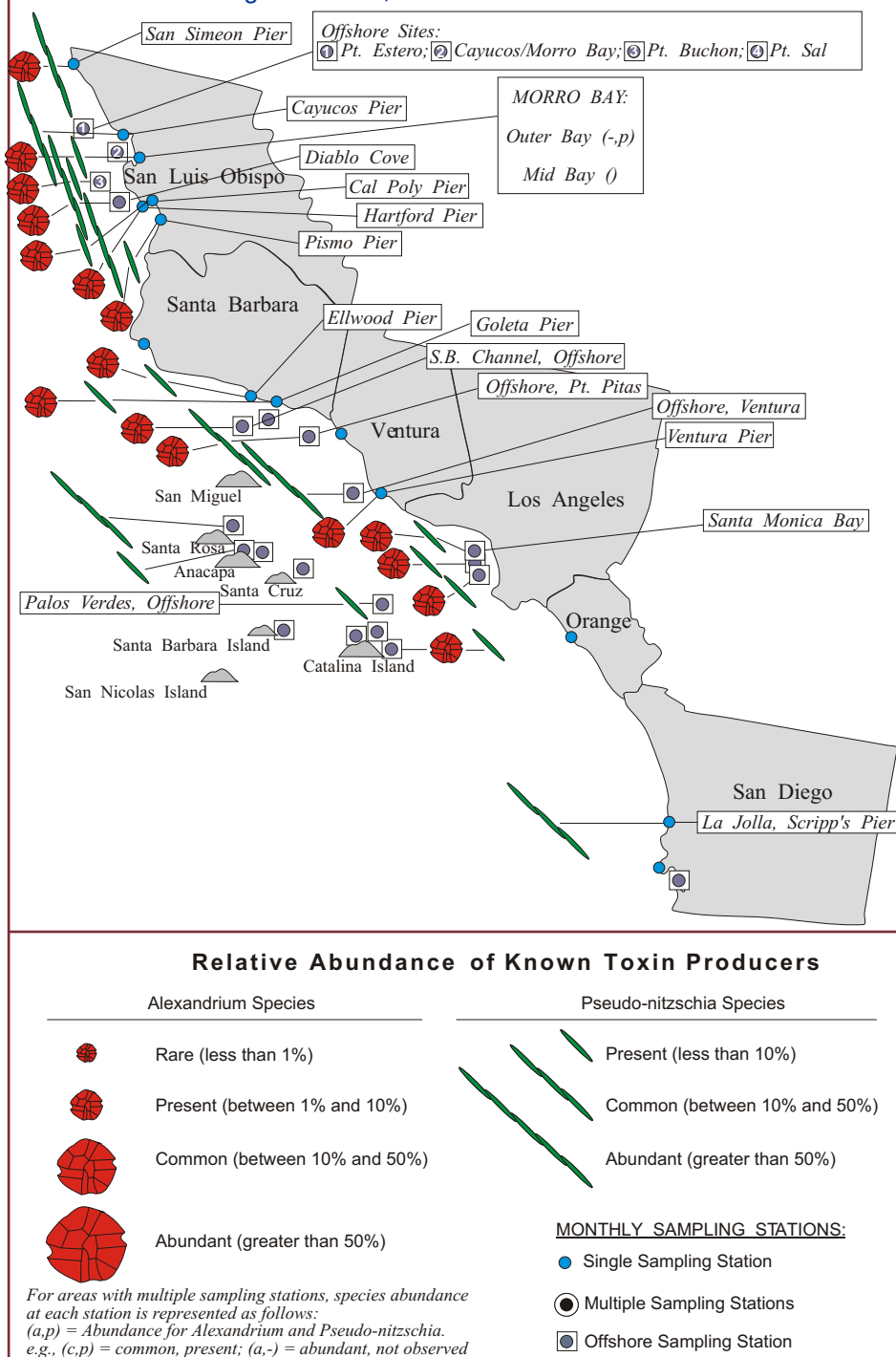
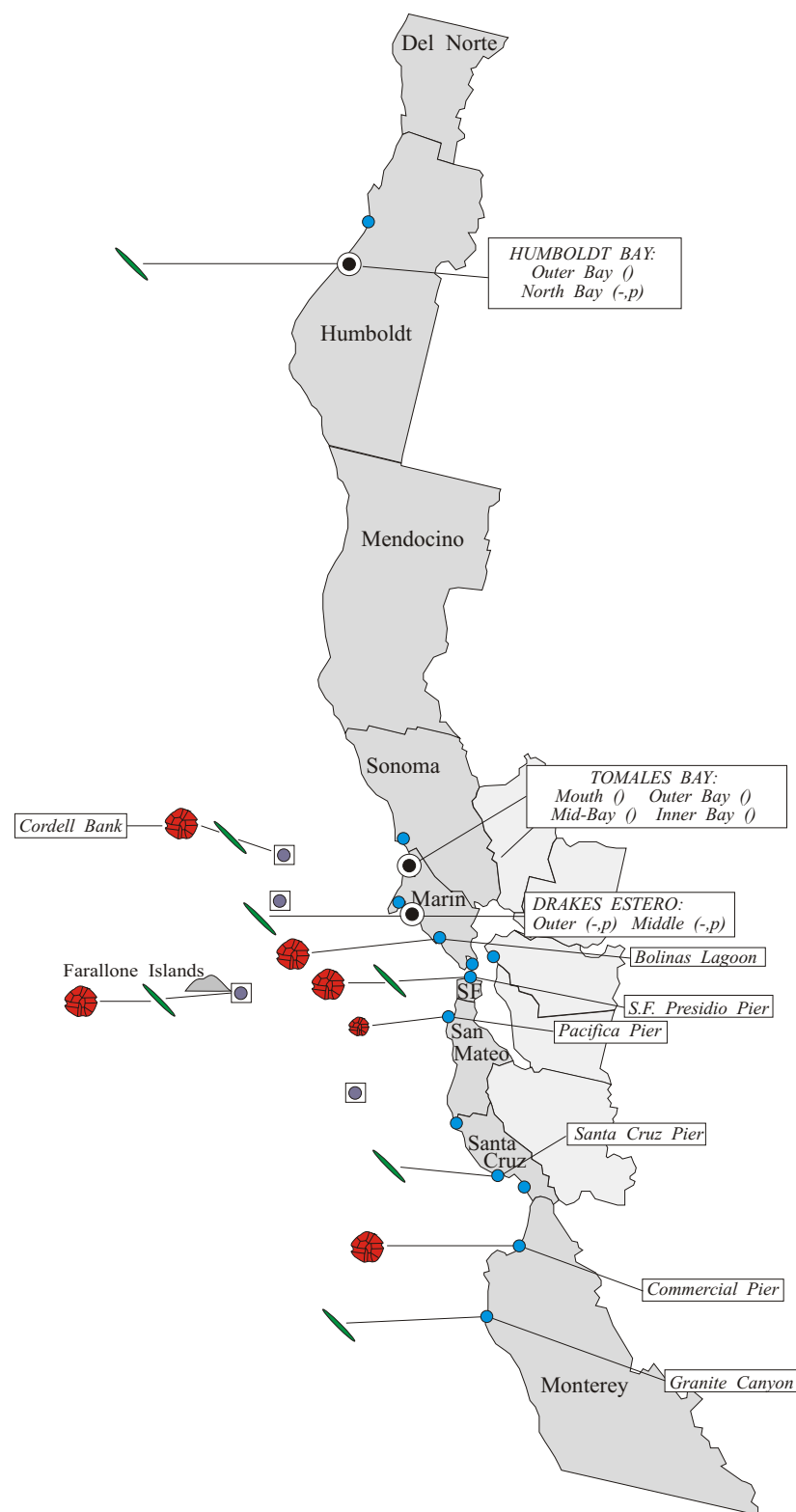


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during November, 2006.



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observations represent an increase in the distribution of this dinoflagellate compared to observations in October, with a southward extension in range. *Alexandrium* was observed at several offshore sites as well. The relative abundance of *Alexandrium* decreased at sites along the San Luis Obispo coast. The highest cell numbers were observed at San Simeon Pier (November 6) and Pismo Pier (November 22). This marks the ninth consecutive month that *Alexandrium* has been observed along a significant portion of the Southern California coast.

The elevated concentrations of PSP toxins detected inside Morro Bay (San Luis Obispo County) in September and October continued through the first two weeks of November (Figure 3). Toxin concentrations reached 556 ug/100 g shellfish tissue by November 2. Elevated toxin levels were also detected in mussels from San Simeon Pier on November 2 (312 ug) and the Cal Poly Pier in Avila on November 7 (324 ug). Low toxin levels were also detected in mussels from Cayucos Point on November 3 and November 20.

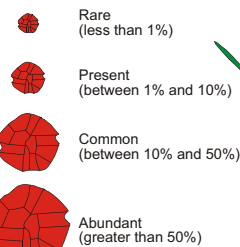
Domoic Acid

Pseudo-nitzschia continued to be observed along the entire Southern California coast in November (Figure 1). The distribution was

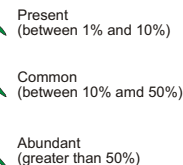
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Relative Abundance of Known Toxin Producers

Alexandrium Species



Pseudo-nitzschia Species



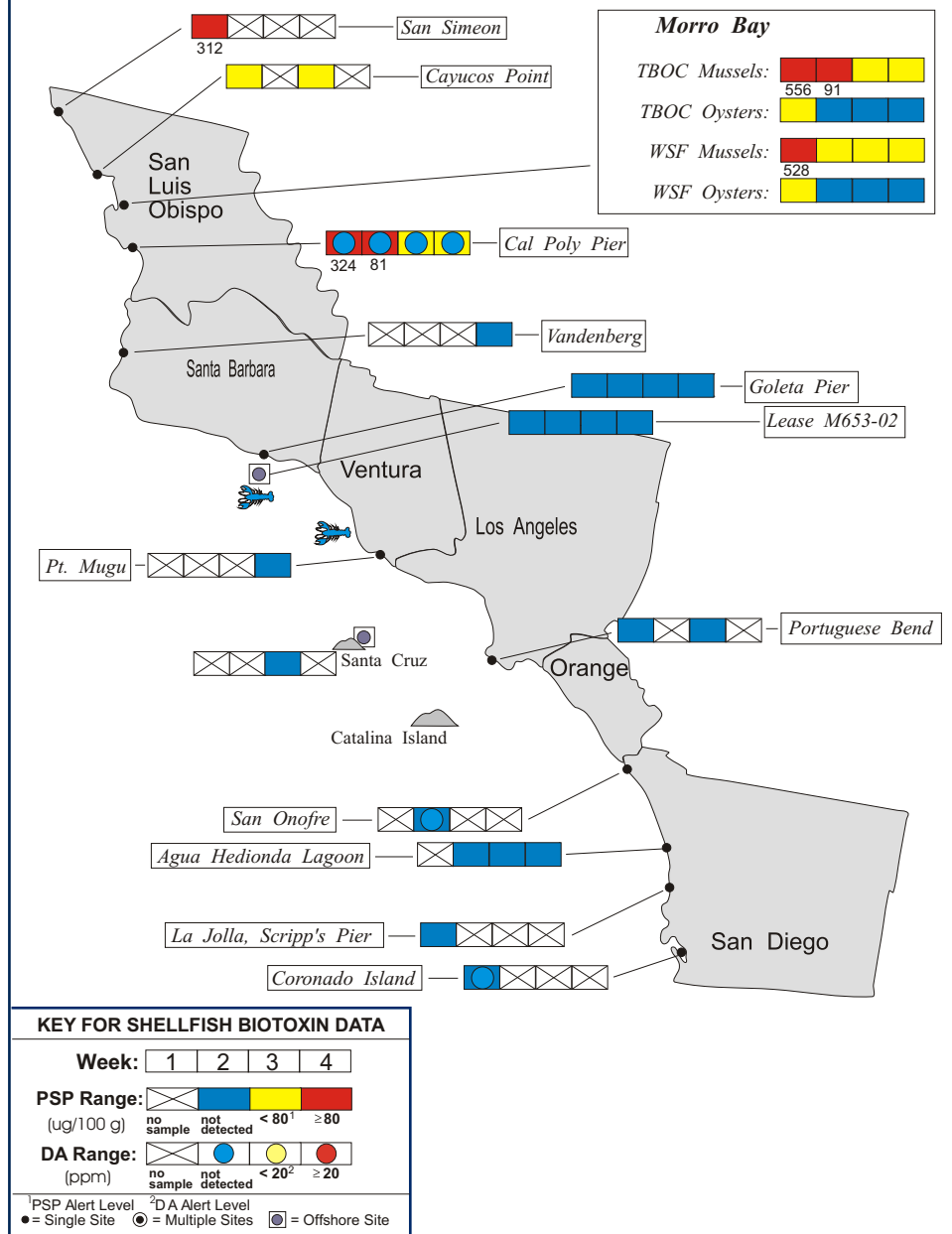
MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 3. Distribution of shellfish biotoxins in Southern California during November, 2006.



(Continued from Page 2)

similar to observations in October but this diatom was detected at a greater number of sampling sites. The relative abundance appeared to increase slightly between San Luis Obispo and Santa Barbara. Cell densities were very low at all sites. Domoic acid was not detected in any shellfish samples collected in November.

Non-toxic Species

The Southern California coast continued to be characterized by a variety of diatoms (*Chaetoceros*) and dinoflagellates (*Ceratium*, *Akashiwo sanguinea*), with the dinoflagellates predominant at most locations. *Cochlodinium* was common to abundant at several sites between San Luis Obispo and Los Angeles counties.

Northern California Summary:

Paralytic Shellfish Poisoning

The distribution of *Alexandrium* in November was similar to observations in October (Figure 2), however it was seen at many fewer sampling stations. The highest relative abundances of *Alexandrium* occurred inside Bolinas Lagoon (November 6).

Low levels of PSP toxins continued to be detected at a number of sites along the

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553-4133

(Continued from Page 3)

Northern California coast (Figure 4). By the end of the month the toxin levels decreased below the detection limit inside Drakes Estero but remained detectable through the end of the month in mussel samples from San Mateo, Santa Cruz, and Monterey counties.

Domoic Acid

The distribution of *Pseudo-nitzschia* was similar to observations in October (Figure 2), however this diatom was observed at fewer locations within this range. Very low numbers of this diatom were observed at a few sampling stations between Humboldt and Monterey counties. Domoic acid was not detected in any shellfish samples collected in November.

Non-toxic Species

A mix of diatoms and dinoflagellates occurred along the Northern California coast in November. Common diatoms included *Chaetoceros* and a variety of centric species. Common dinoflagellates included *Ceratium*, *Akashiwo sanguinea*, *Prorocentrum*, and *Cochlodinium*, however none were ubiquitous along the entire coast. *Cochlodinium* was common to abundant at sites inside Monterey Bay. This dinoflagellate was also common inside Bolinas Lagoon and offshore of Sonoma County near Cordell Banks.



QUARANTINES:

The annual quarantine on the sport-harvesting of mussels was rescinded at midnight on October 31 for all coastal counties except San Luis Obispo. The

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Figure 4. Distribution of shellfish biotoxins in Northern California during November, 2006.

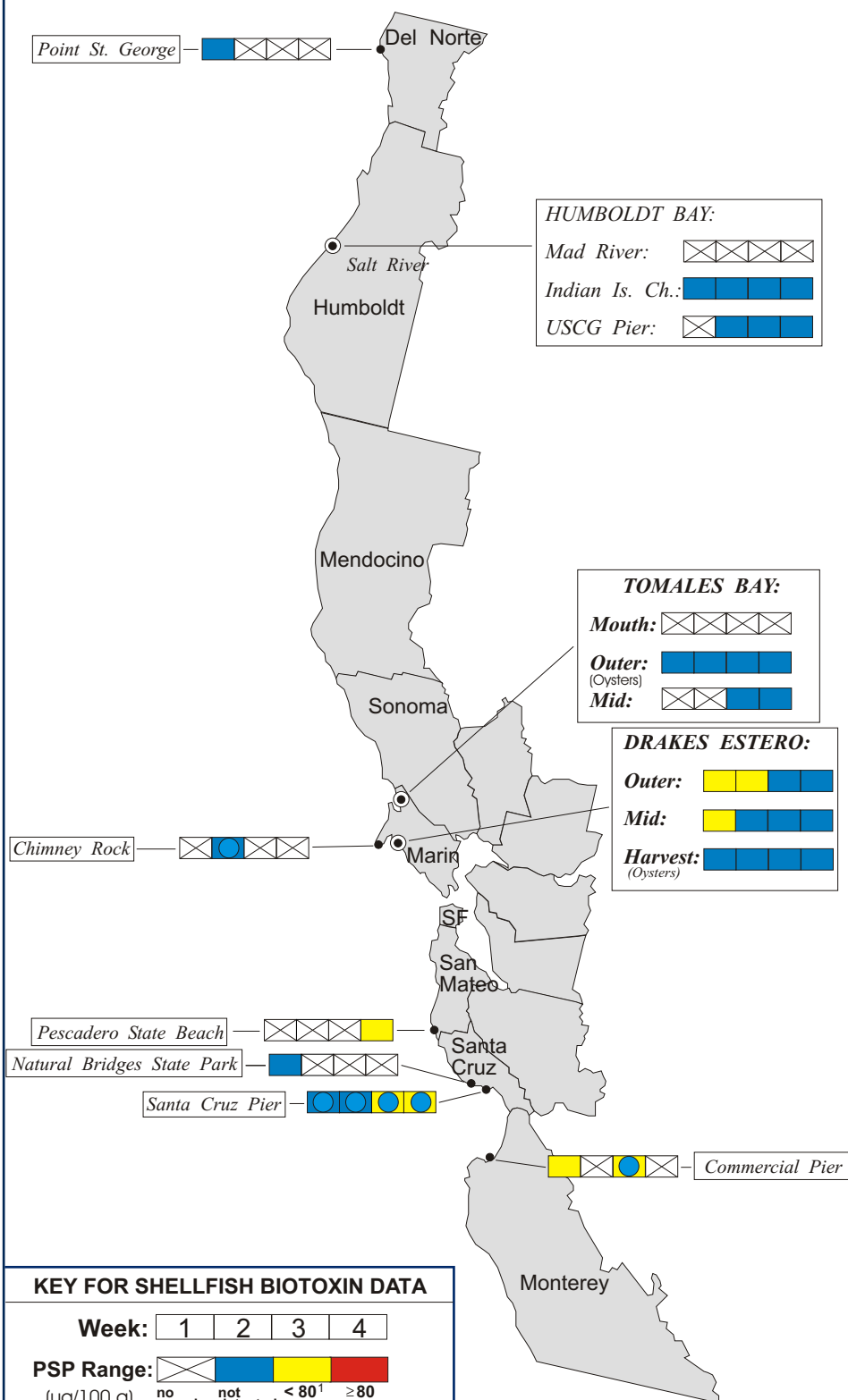


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during November, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	8
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	2
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	4
	CDHS Marine Biotoxin Monitoring Program	1
	Marin Oyster Company	1
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Department	1
Monterey	Monterey Abalone Company	6
San Luis Obispo	Williams Shellfish Company	14
	California Polytechnic State University	4
	Tomales Bay Oyster Company	10
	CDHS Volunteer (Oto Schmidt)	2
	NOAA Coastal Discovery Center, San Simeon	1
Santa Barbara	Santa Barbara Mariculture Company	10
	U.C. Santa Barbara	5
	Vanderberg AFB	1
	CDHS Volunteer (Bill Weinerth)	2
Ventura	CDHS Volunteer (Bill Weinerth)	2
	Naval Air Station, Pt. Mugu	1
Los Angeles	Los Angeles County Health Department	2
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	3
	CDHS Volunteer (Steve Crooke)	2
	Scripps Institute of Oceanography	1

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presence of high PSP toxin levels and elevated numbers of the toxin-producing dinoflagellate required an extension of the mussel quarantine for this county. The annual mussel quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries. Routine biotoxin monitoring is maintained throughout this period. The annual quarantine does not affect the certified commercial shellfish growing areas in California. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat.

Consumers are also advised that cooking does not eliminate the toxins from the shellfish tissue. Sport harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



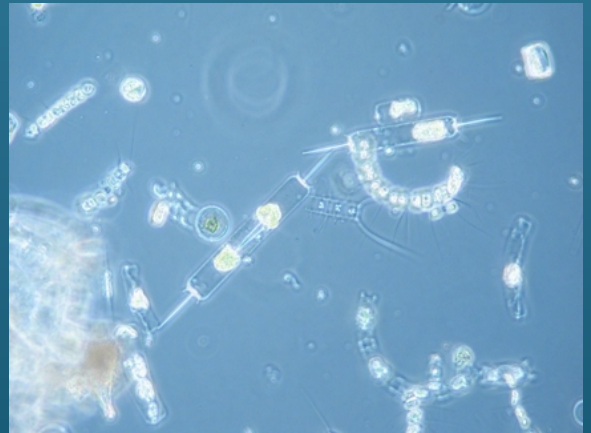
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during November, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	3
Mendocino	None Submitted	
Sonoma	Cordell Bank National Marine Sanctuary	1
Marin	CDHS Volunteer (Brent Anderson)	4
	Drakes Bay Oyster Company	7
	CDHS Marine Biotoxin Monitoring Program	1
	Audubon California	2
Contra Costa	CDHS Marine Biotoxin Monitoring Program	1
San Francisco	CDHS Volunteer (Eugenia McNaughton)	3
	Gulf of the Farallones National Marine Sanctuary	3
San Mateo	Marine Mammal Center Volunteer (Stan Jensen)	2
	U.C. Santa Cruz	1
Santa Cruz	U.C. Santa Cruz	5
	Marine Mammal Center Volunteers (Nancy Scarborough)	3
Monterey	Monterey Abalone Company	3
	Marine Pollution Studies Laboratory	3
San Luis Obispo	Morro Bay National Estuary Program	3
	CDHS Volunteers (Renée and Auburn Atkins, Fathom Neft)	5
	California Polytechnic State University	5
	NOAA Coastal Discovery Center, San Simeon	1
	Tenera Environmental	3
	Marine Mammal Center Volunteers (Debby Davis, Teri Woodhouse)	9
Santa Barbara	Channel Islands National Marine Sanctuary	2
	National Park Service	4
	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
	CDHS Volunteer (Sylvia Short)	4
Ventura	CDHS Volunteer (Fred Bugess)	2
	Channel Islands National Marine Sanctuary	2
	National Park Service	1
Los Angeles	Los Angeles County Sanitation District	1
	City of Los Angeles Environmental Monitoring Division	11
	Catalina Island Marine Institute	1
	Tide More (Guided Discoveries)	8
Orange	CDHS Volunteer (Debbie Karimoto)	1
San Diego	Scripps Institute of Oceanography	3
	DHS Volunteer (Paul Sims, Claire Sims)	6

PHYTOPLANKTON GALLERY



A variety of centric diatom species were common along the Northern California coast.



The diatom *Ditylum* was common at sites inside San Francisco Bay.



The dinoflagellate *Lingulodinium* began reappearing at some Southern California locations after a long absence.